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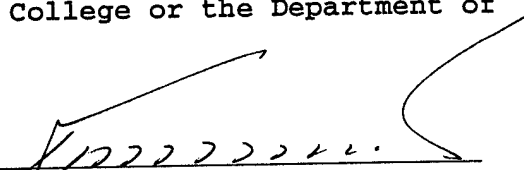
THE U-BOAT WAR IN THE CARIBBEAN: OPPORTUNITIES LOST

by

Karl M. HASSLINGER  
Commander, United States Navy


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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

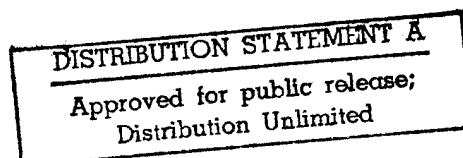
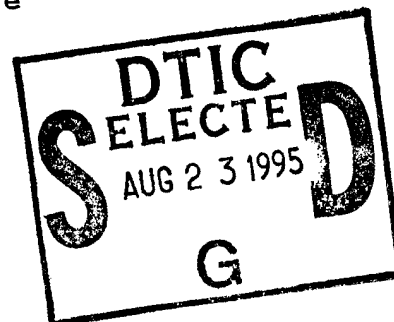
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Captain George W. Jackson, USN  
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# ABSTRACT

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This paper reviews the specific segments of the Battle of the Atlantic that were conducted in and around the Caribbean Sea. The background information explores Germany's political goals and policies in the years prior to the second world war, and the military situation that resulted. The Battle of the Atlantic is reviewed to determine the reasons for sending U-boats to the Caribbean theater, which was at the effective limit of their operational endurance. Further, the operational art aspects of the use of U-boats in the Caribbean theater and the results they achieved are examined in detail. The subsequent withdrawal of U-boats from the Caribbean after only eleven months in the theater is specifically evaluated in light of the personal leadership and operational art abilities of the Commander in Chief of the U-boat Arm, Admiral Karl Doenitz. The paper's conclusion is an evaluation of the title question. Despite the acknowledged tactical success of sinking 400 merchant ships, with the loss of only seventeen U-boats, the author concluded that the Germans did not exploit all available opportunities that may have allowed them to achieve an even greater operational success in the prosecution of the Battle of the Atlantic.

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## THE U-BOAT WAR IN THE CARIBBEAN: OPPORTUNITIES LOST

Shortly after the United States entered the second world war at the end of 1941, Germany shifted the focus of its Atlantic U-Boat operations to the areas off the north east coast of the United States and Canada. Several months later, U-boat operations pushed farther south along the coast and eventually into the Gulf of Mexico and the Caribbean Sea. The small number of U-boats operating in these areas were highly effective in interdicting the merchant shipping that traversed the Caribbean and Atlantic seaboard. The tremendous losses sustained embarrassed the United States and infuriated the British, for whom much of this shipping was vital to their very survival.<sup>1</sup> Germany considered the U-boat war in the Caribbean highly successful by virtue of the large number of merchant ships sunk. However, what kind of success was it; operational or tactical? Were opportunities available for Germany to have achieved a more decisive success?

### BACKGROUND

Adolph Hitler's political testament Mein Kampf, provides significant insight into the end state that he envisioned for the termination of his military adventures that precipitated the second world war. His National Socialist Party creed professed the inherent right of the German race to establish an empire on the European continent by virtue of their racial superiority. Hitler also acknowledged the right of the English, as racially pure people of Germanic decent, to maintain their large colonial empire and exercise control over it. Naturally, their colonial empire necessitated the

maintenance of a large navy. Hitler convinced himself and many around him that England would acquiesce to his expansionist activities as long as Germany did not threaten English interests by building a large navy, increasing foreign trade or attempting to establish colonies. In the worst case, he thought that if war with England did come, it would be a short one, because besides treaty obligations, it would not be in England's interest to fight for continental issues.<sup>2</sup> Accordingly, a major naval build-up was not a German concern, however Hitler did want a larger navy to enhance German prestige on the world stage.

In 1935 Germany negotiated the London Treaty, in which England allowed Germany to increase its navy to a size equal to one-third that of the Royal Navy. A year later, England allowed Germany to increase its submarine force to 100 per cent of the Royal Navy.<sup>3</sup> When England later became hostile toward his governments destabilizing political aims, Hitler revised his overall goals in November 1937, to include military action against England. The time-frame was unspecified, however he assured his generals and admirals that it would not be until after the conquest of Europe.<sup>4</sup> As a result of this new political objective, Hitler agreed with the Commander in Chief of the German Navy, Admiral Erich Raeder, that Germany should embark on a shipbuilding program (called the Z-Plan) that would provide for a balanced fleet, capable of war with the Royal Navy, by 1948. As tensions built, Hitler later directed that the plan be expedited for completion in only six years.<sup>5</sup>

When England entered the war in support of Poland and France,

both Raeder and the German U-boat Arm Commander, Admiral Karl Doenitz were shocked. Blinded by Hitler's earlier political successes in winning appeasement, they had placed a lot of stock in Hitler's assurances that he would prevent England from entering the war.<sup>6</sup> On the third of September 1939, when the Germans found themselves at war with the Royal Navy, they knew that the *Kriegsmarine* was unprepared. The surface fleet was insignificant, and the U-boat arm had only 56 submarines in commission, of which 26 were suitable for operations in the Atlantic. The remaining Type II U-boats had such a limited range, that they could only operate in the North Sea area.<sup>7</sup>

Germany determined that the national will of the English people was the center of gravity of its struggle against England. Hitler and the German High Command reasoned that a negotiated peace with England was the best prospect for quickly ending hostilities, at least until the Russian campaign was over. Germany hoped to influence the English to abandon their European allies by creating terror, hardship and deprivation on an unprecedented scale. The island nation's critical vulnerability was her lines of communication that could be severed by U-boat and Luftwaffe attacks on merchant ships, creating an impenetrable blockade that would foster the deprivation they sought.

From September 1939, until the United States entered the war in December 1941, a small but increasing number of U-Boats waged a strong war in the North Atlantic against the resupply of England. Despite the immediate implementation of a convoy system, the patrol and escort platforms initially available, and the state of crew training and experience were not sufficient to prevent major losses. U-boats were

successful in reducing monthly imports by almost half.<sup>8</sup> Overall, U-boats sunk approximately 950 ships which accounted for two and one-half million tons of shipping capacity. This was accomplished at a cost of 95 U-boats lost in two years of war.<sup>9</sup> The thought that England was surrounded by a ring of sinister U-boats had a profound psychological effect on the English people. While considering even the massive destruction and horror of the London Blitz, Winston Churchill wrote: "The only thing that ever really frightened me during the war was the U-boat peril."<sup>10</sup>

The entry of the United States into the war was another shock to the Germans. Trying to buy time for the construction of more U-boats, Germany had tried hard to prevent incidents between U-boats and United States Navy ships escorting convoys. U-boat commanding officers received strict rules of engagement, and were held accountable for inadvertent attacks of neutral shipping.<sup>11</sup>

Admiral Doenitz had anticipated the prospects of war with the United States, and if war was initiated by Hitler, he intended to have as many U-Boats as possible in American waters at the start of hostilities. His expectation was that actions against merchants in American waters would be facilitated by a lack of experience and proficiency, similar to the events that took place in the waters around England at the start of the war.<sup>12</sup> Also, the opening of American waters provided a vast area for U-Boat operations with numerous focal points of shipping. By taking the initiative as the attackers, the main thrust of the U-Boat effort could be repeatedly shifted, providing surprise to the Americans and the requirement to

spread their forces in an attempt to cover larger areas of possible engagement.<sup>13</sup>

When the Germans initiated Operation Paukenschlag (Drumbeat) in January 1941, six U-boats sailed to the east coast of the United States, to find an enemy who acted as though peace was at hand. Fully lighted navigation aids and coastal cities provided lighting to silhouette merchant targets. Merchant ships sailed alone and few if any patrol ships or aircraft were assigned. The Commander in Chief of the Atlantic Fleet, Admiral Ernest J. King, who a year earlier told his Fleet that the United States needed to prepare for a war that was close at hand,<sup>14</sup> had not implemented any effective antisubmarine warfare program. As a consequence, a small number of U-boats exacted staggering losses. A disconcerted President Roosevelt wrote to Churchill: "...My Navy has definitely been slack in preparing for this submarine war off our coast."<sup>15</sup>

## ANALYSIS OF THE U-BOAT WAR IN THE CARIBBEAN THEATER

### German Successes

After several months of slaughter along the east coast, the Americans finally responded with a temporary fix and instituted a "Leap-Frog" convoy system (ships sailed only short distances, and then sought safe harbor at night). Doenitz responded by shifting the focus of U-boat operations to the Gulf of Mexico and the Caribbean Sea.<sup>16</sup> Despite the long transit, leaving even the largest U-boats with enough



fuel for only about two to three weeks on station, Doenitz recognized the value of operational maneuver in repositioning his limited forces to strike at weak points, where the largest number of ship's could be sunk per day. In addition to Doenitz' use of operational maneuver as a means of diluting his enemy's defensive efforts, he also gained an edge for his forces by shifting them to the Caribbean. The United States Navy had no effective system of promulgating "Lessons Learned" to units not previously involved in antisubmarine warfare. Therefore, the lack of organization and experience among newly assigned ships and squadrons hastily deployed to the Caribbean, significantly improved the survivability of the U-boats they engaged.

The Caribbean theater provided more than just a new area of operations. Doenitz identified a critical vulnerability in this theater that was related to oil. He determined that the industrial capacity of the United States was their strategic center of gravity, and that it was not directly susceptible to attack. However, heavy manufacturing enterprises like the shipbuilding industry relied on oil to fuel its operations. Since 95% of American oil passed from the Gulf ports to the refineries on the east coast, the Caribbean theater provided a significant opportunity to attack the tanker traffic in and around the Gulf of Mexico and the straits of Florida.<sup>17</sup> Alternative methods of transportation, e.g., rail or truck were unrealistic for the quantity of oil that needed to be moved. Although pipelines could handle the volume, it would take an excessive period and considerable effort to construct them. Accordingly, the destruction of the American oil tankers was a major priority and would have a considerable effect on American industry in general and the

shipbuilding program specifically.<sup>18</sup>

Further south in the Caribbean, the tankers that carried oil from Venezuela to the Dutch refineries on Aruba and Curacao were also priority targets. Unfortunately for the allies, these tankers were specially designed, shallow draft tankers that allowed them to pass through the shallow Gulf of Venezuela. Normal tankers could not be substituted here; their loss was replaceable only by new construction.<sup>19</sup> At one point, the sinking of four of these tankers so severely shocked the remaining crews, that they mutinied and refused to go to sea without proper escorts. This virtually stopped England's major supply of oil.<sup>20</sup>

The U-boat effort against oil shipments was so effective, that in June 1942, the United States Army and Navy both supported an effort by the Petroleum Administration for War to construct a massive pipeline from Texas to the east coast. Due to the considerable allocations of steel and manpower required, this project was rejected on two previous occasions. This time, it was quickly approved by the Roosevelt administration.<sup>21</sup> By the end of 1942, fuel stocks for allied operations in North Africa were dangerously low. This prompted Roosevelt and Churchill to seek alternative routes, such as a direct transfer of oil from the Caribbean to Gibraltar. When this was later attempted, the poorly escorted convoy was discovered by a U-boat, reported and repeatedly attacked.<sup>22</sup>

The geography of the Caribbean, unlike the North Atlantic provided numerous natural choke points, solving one of the U-boats

biggest problems: target acquisition. Possessing only primitive listening gear, U-boats had to acquire their targets by sight via lookouts on the surface, or by the much more limited view through a periscope when submerged. These decisive points were well patrolled by U-boats, and it should not have surprised the Americans that a majority of sinkings were at the entrances to major oil ports, island passages and the Panama Canal.<sup>23</sup> Although the Panama Canal area was heavily fortified in the years prior to the start of the war, aircraft stationed there consisted mostly of fighters. Americans considered that the major threat to the canal was an air attack by bombers from a Japanese aircraft carrier, or *Luftwaffe* bombers operating from primitive fields in a sympathetic South American country.<sup>24</sup> These fighters were effectively useless against U-boats, allowing them to operate successfully against the almost eight million tons of shipping that passed through the canal each year destined for England.<sup>25</sup>

The hand picking of the first German U-boat commanding officers sent to the Caribbean was of significant value. Most were men who previously served in the German Merchant Marine and were familiar with many of the Caribbean ports and passages that they now patrolled. This gave them the confidence to more closely approach shallow harbor entrances, and in some cases actually enter harbors.<sup>26</sup> One such commanding officer brought U-156 sufficiently close to use his deck gun to set fire to the oil refinery on Aruba, after torpedoing and sinking several ships in the harbor.<sup>27</sup>

Tanker U-boats, or "*Milch Cows*" were built to carry a cargo of only fuel oil and supplies.<sup>28</sup> U-boats headed for the Caribbean would

transit to the calm seas south of the Azores and refuel at sea, prior to continuing west. This innovative logistical ability allowed even the smaller Type II boats with limited range to conduct several weeks of operations in the Caribbean, effectively increasing the total number of boats available for operations. Further, ships that had exhausted their supply of torpedoes early in their patrols, gave up their excess fuel to other boats, before returning home. This was done with make-shift rigs, as the boats drifted in calm seas.

### German Failures

In his memoirs, Admiral Doenitz cited the above German successes as key factors in the use of U-boats in the Caribbean theater. Taken alone, the large number of ships sunk relative to losses suffered would indicate that U-boat operations in this theater were a major success. Indeed, Admiral Doenitz used this "Success" to enhance his personal power and prestige and to obtain additional funding and a higher material priority for U-boat construction. However, a closer analysis of these operations reveals several problems.

- First, Doenitz used an effective U-boat quotient (the average sinking per U-boat per day for all U-boats at sea) as a measure of effectiveness.<sup>29</sup> This quotient reached an all time high during Caribbean operations, providing a false sense of success, since it was only a measure of attrition warfare. It did not take into account the overall number of enemy ships (which was rising rapidly due to the massive industrial might of the United States), nor the ability of Germany to build replacement U-boats with limited labor and material,

not to mention constant bombing of construction and repair facilities by the Royal Air Force and later the U. S. Army Air Force.

- Secondly, although he identifies oil as a critical vulnerability, mass was never achieved in the Caribbean theater to attack it decisively. Doenitz wrote in his memoirs that he repeatedly asked for greater numbers of U-boats (Doenitz shared control of U-boat assets with the German High Command), but was not able to persuade Hitler through Admiral Raeder to release them. Consequently, overwhelming force was not applied to a decisive point, when U-boat assets were repeatedly siphoned off to support inconsequential endeavors that reflected Hitler's lack of understanding of the use of submarines and sea power.<sup>30</sup> For example, in an attempt to maximize British losses in support of German forces in North Africa,<sup>31</sup> Hitler ordered all available U-boats to the Mediterranean theater. During Operation Drumbeat, some thirty-six U-boats were stationed in the Mediterranean Sea as compared to thirteen in the entire Atlantic. Although the resupply of England was identified as the critical vulnerability, it was not attacked with the single-minded determination required to ensure success. U-Boats in the Mediterranean theater did little to minimize English submarine and air attacks against German and Italian supply ships destined for Africa. These U-boats were generally ineffective and in fact sustained heavy losses.<sup>32</sup>

- Doenitz closely watched U-boat statistics to identify the culminating point of his efforts in the Caribbean. In the fall of 1942, when American convoy and patrol efforts in the Caribbean were successful in reducing shipping losses (a large drop in his U-boat

quotient), some U-Boats were sent to the area east of Brazil, where many ships still sailed independently,<sup>33</sup> while the main focus shifted back to the mid-Atlantic area, out of range of land based aircraft. However, since the convoy system and antisubmarine warfare patrols were well established and more experienced than Caribbean based units, this shift of priorities was inconsistent with the evaluation of Caribbean oil shipments as a critical vulnerability. In reality, the evidence shows that Doenitz was set on proving his life-long thesis; that a large wolf-pack could overcome a well defended convoy. By this time in the war, he had the larger number of U-boats he thought he needed to test his theory. In practice, U-boats attacking North Atlantic convoys were sunk in record numbers.

- In the fall of 1942, when Doenitz pulled his forces out of the Caribbean, he had approximately 350 U-boats. This was 50 more than the 300 he claimed to need before the war to effectively strangle England. However, although 350 U-boats were in commission, only 95 were considered operational and only 25 were engaged in the Atlantic on a given day! Serious deficiencies existed in the methods by which U-boats were refit and readied for further operations, and by which newly constructed ships were manned, trained and certified as ready for war. In May 1942, at the height of the Caribbean effort, 114 U-boats were in the Baltic working-up for deployment. Doenitz specifically reported this problem to Hitler, admitting that immediate and significant improvement was required.<sup>34</sup>

- Germany's shift of the center of gravity of its strategic war effort to the conquest of the Soviet Union instead of concentrating on

England, relegated U-boat operations to a side-show. The Russian offensive required massive amounts of men, fuel and material. This robbed the U-boat arm of both material for its building program, men to man the ships, and the focus necessary to coordinate efforts to bring an overwhelming force into play against England.<sup>35</sup>

- Several factors that took place before the war had a significant impact on all theaters of the U-boat war. The most important was the moving target of the naval building program based on shifting political objectives. Hitler miscalculated the English response to his aggression. Then, when he felt forced to initiate hostilities before England and France could rearm, he had no fall back position relative to the war against England. The size of the German Navy was inadequate by any measure to carry out any of the missions planned by the navy and High Command. Moreover, a country may be able to build ships at a high rate, but it cannot build experienced captains. Doenitz complained bitterly in his war diary about the ineffectiveness of most new U-boat commanders.

Secondly, after the war started, the U-boat building program was inadequate. The "Z-Plan" building program gave priority to surface combatants.<sup>36</sup> Also, despite repeated assurances from Hitler that precious manpower and material resources would be diverted to U-boat construction, shipbuilding and other armaments programs suffered due to corrupt bureaucracies and political intrigues. Only after the U-boat successes in American waters and the army's defeat at Stalingrad did Hitler demand increased production performance.<sup>37</sup> Labor, material problems and limited shipyard space continuously confounded

construction and repair efforts. However, Germany's construction of 300 U-boats (while shipyards and factories were being bombed by the Royal Air Force) in 1942 as compared to only 250 U-boats built the two previous years answers the question of capability. If Hitler had fully realized their potential, Germany could have had a sizable U-boat fleet at the start of the war. He should have realized this, since the effectiveness of U-boats was proven in the first world war.<sup>38</sup>

- Germany was slow to modernize their submarines. Most of the improvements made during the war were in response to research, development and implementation on the part of the English and Americans. When U-boats were surprised by aircraft with radar, the Germans installed a primitive radar detector that they obtained from the French. When the English altered the frequency of their radars, the Germans were slow to respond. When powerful searchlights were fastened to the wings of American patrol planes and U-boats were found on the surface at night charging batteries, the Germans again "responded" by inventing the *Schnorkel*. For the most part, the U-boats in use during the war were only larger models of earlier U-boats, with an increased operating range their only improvement. When the problem of poor submerged speed was tackled near the end of the war by building a U-boat with a much larger battery capacity and an improved hull shape, the Armaments Minister Albert Speer questioned:

Why had we not begun building this new type of U-boat earlier? For no technical innovations were employed; the engineering principles had been known for years. The new boats, so the experts assured us, would have revolutionized submarine warfare. This fact seemed to be appreciated by the American navy, which after the war began building the new type for itself.<sup>39</sup>



## CONCLUSIONS

When Hitler initiated hostilities four years earlier than he previously planned, the navy started the war desperately in need of ships, U-boats and auxiliaries. As England continued to fight on, the Nazi's continued to believe that she would soon tire and negotiate a settlement. Consequently, U-boat construction was paltry until 1942. Left to fight a war with a small force, Admiral Doenitz skillfully employed operational maneuver as a force multiplier, forcing the enemy to patrol large areas while he struck soft spots in the enemy's defense to ensure the maximum damage for the minimum risk to his own forces.

Claiming to recognize the decisive points and critical vulnerabilities in the Caribbean theater associated with inadequate and inexperienced antisubmarine forces, and the allies' oil supplies, Doenitz dealt the allies an early devastating blow. However, due to the ignorance of Hitler and the German High Command regarding the use of sea power, Doenitz was not able to convince them to commit overwhelming force to the U-boat war in the Caribbean. Thus, despite tactically successful operations, the allies were able to keep enough oil and supplies flowing to defend England and maintain a robust shipbuilding program. In his memoirs, Doenitz noted that:

The relationship between ships sunk and ships built shows clearly what grave consequences ensued for the German war effort from the failure of our leadership to do everything possible to initiate a speedy and large U-boat building program even as late as the outbreak of war and from our failure to use even such meager U-boat resources as we possessed exclusively to carry out their primary function, the destruction of enemy shipping.<sup>40</sup>

In addition to the above failure, Doenitz cannot shield himself from shifting the focus of his attack from the Caribbean oil supplies to the wolf-pack attacks on convoys in the North Atlantic. In discussions with his staff, he commented: "It is incomparably more important to sink than to reduce sinkings by making them in a prescribed area."<sup>41</sup> The sinking of ten ships carrying fruit to England is arguably of lesser importance than the sinking of a single tanker carrying oil to an east coast refinery, even if the former results in a higher tonnage for the war record.

Germany failed to seize an opportunity to inflict a devastating blow on the allied war effort by interdicting the supply of oil and gasoline to both England and the United States. England, dependent on oil and gasoline to fuel the Royal Air Force would have become even more vulnerable to the *Luftwaffe* attacks on industry and ports. The United States, although secure in its borders, would have suffered a reduction in shipbuilding and other war economy production. Already implementing alternative methods of transporting oil and gasoline, the ability of the United States to supply England would have been diminished and the time required to mount offensive operations overseas would have been extended. Since the target of Germany's effort was the national will of the English people, and their ability to endure further hardship is unmeasurable, the possible success of a more decisive U-boat effort in the Caribbean can never be determined.

## NOTES

1. Churchill, Winston S. Memoirs of the Second World War (Boston: Houghton Mifflin Company, 1959), p. 545.
2. Bengston, John R. Nazi War Aims (Rock Island, Illinois: Augustana College Library, 1962), p. 34.
3. Martienssen, Anthony. Hitler and his Admirals. (New York: E. P. Dutton and Company Inc., 1949), pp 10-11.
4. Ibid. p.12.
5. Doenitz, Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), pp 37-38.
6. Padfield, Peter. Men of War. (New York: St. Martin's Press, 1992), pp 177-178.
7. Doenitz, Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), p. 46.
8. Churchill, Winston S. Memoirs of the Second World War. (Boston: Houghton Mifflin Company, 1959), p. 412.
9. British Central Office of Information. The Battle of the Atlantic. (London: His Majesty's Stationery Office, 1946), p. 47.
10. Ibid.
11. Controller of Her Britannic Majesty's Stationery Office. Fuehrer Conferences on Naval Affairs 1939-1945. (London: 1990), p 232.
12. Doenitz Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), p. 195.
13. Ibid. p. 196.
14. Padfield, Peter. Men of War. (New York: St. Martin's Press, 1992), p. 76.
15. Riesenbergs, Felix. Sea War. (New York: Rinehart and Company, 1956), p. 76.
16. Ibid. p. 77.
17. Editors of Look Magazine. Oil for Victory. (New York: McGraw-Hill Book Company, 1946), p. 87.
18. Controller of Her Britannic Majesty's Stationery Office. Fuehrer Conferences on Naval Affairs 1939-1945. (London: 1990), p. 281.
19. Kelshall, Gaylord T. The U-Boat War in the Caribbean. (Trinidad and Tobago: Paria Publishing Company Ltd., 1988), p. 23.

20. Ibid. p. 43.

21. Editors of Look Magazine. Oil for Victory. (New York: McGraw-Hill Book Company, 1946), p. 113.

22. Kelshall, Gaylord T. The U-Boat War in the Caribbean. (Trinidad and Tobago: Paria Publishing Company Ltd., 1988), p. 252.

23. British Central Office of Information. The Battle of the Atlantic. (London: His Majesty's Stationery Office, 1946), p. 40.

24. Kelshall, Gaylord T. The U-Boat War in the Caribbean. (Trinidad and Tobago: Paria Publishing Company Ltd., 1988), p. 7.

25. Padelford, Norman J. The Panama Canal in Peace and War. (New York: The Macmillian Company, 1943), p. 263.

26. Riesenbergs, Felix. Sea War. (New York: Rinehart and Company, 1956), p. 113.

27. Kelshall, Gaylord T. The U-Boat War in the Caribbean. (Trinidad and Tobago: Paria Publishing Company Ltd., 1988), p. 31.

28. Riesenbergs, Felix. Sea War. (New York: Rinehart and Company, 1956), p. 121.

29. Doenitz, Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), p. 102.

30. Raeder, Erich. The Struggle for the Sea. (London: William Kimber and Company Limited, 1959), p. 127.

31. Hoyt, Edwin P. The Death of the U-Boats. (New York: McGraw-Hill Book Company, 1988), p. 111.

32. Doenitz, Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), p. 158.

33. Kelshall, Gaylord T. The U-Boat War in the Caribbean. (Trinidad and Tobago: Paria Publishing Company Ltd., 1988), p. 253.

34. Martienssen, Anthony. Hitler and his Admirals. (New York: E. P. Dutton and Company, Inc., 1949), p. 134.

35. Padfield, Peter. Men of War. (New York: St. Martin's Press, 1992), p. 190.

36. Ibid. p. 38.

37. Speer, Albert. Inside the Third Reich. (New York: The Macmillian Company, 1970), p. 274.

38. Bengston, John R. Nazi War Aims. (Rock Island, Illinois: Augustana College Library, 1962), p. 35.

39. Speer, Albert. Inside the Third Reich. (New York: The Macmillian Company, 1970), p. 274.

40. Doenitz, Karl. Memoirs, Ten Years and Twenty Days. (Bonn: Athenaum Verlag Junker and Duennhaupt, 1958), p. 227.

41. Padfield, Peter. Men of War. (New York: St. Martin's Press, 1992), p. 193.

## BIBLIOGRAPHY

- Bengston, John R. Nazi War Aims. Rock Island, Illinois: Augustana College Library, 1962.
- British Central Office of Information. The Battle of the Atlantic. London: His Majesty's Stationery Office, 1946.
- Churchill, Winston S. Memoirs of the Second World War. Boston: Houghton Mifflin Company, 1959.
- Churchill, Winston S. The Second World War. Volume II, Their Finest Hour. Boston: Houghton Mifflin Company, 1949.
- Controller of Her Britannic Majesty's Stationery Office. Fuehrer Conferences on Naval Affairs 1939-1945. London: 1990.
- Doenitz, Karl. Memoirs, Ten Years and Twenty Days. Bonn: Athenaum Verlag Junker and Duennhaupt, 1958.
- Editors of Look Magazine. Oil for Victory. New York: McGraw-Hill Book Company, 1946.
- Fuehrer Directives and other Top Level Directives of the German Armed Forces 1939-1945. Washington: United States Navy, 1948.
- Hoyt, Edwin P. The Death of the U-Boats. New York: McGraw-Hill Book Company, 1988.
- Kelshall, Gaylord T. The U-Boat War in the Caribbean. Trinidad and Tobago: Paria Publishing Company Ltd, 1988.
- Martienssen, Anthony. Hitler and his Admirals. New York: E. P. Dutton and Company, Inc., 1949.
- Padelford, Norman J. The Panama Canal in Peace and War. New York: The MacMillan Company, 1943.
- Padfield, Peter. Men of War. New York: St. Martin's Press, 1992.
- Raeder, Erich. The Struggle for the Sea. London: William Kimber and Company Limited, 1959.
- Riesenberg, Felix. Sea War. New York: Rinehart and Company, 1956.
- Speer, Albert. Inside the Third Reich. New York: The Macmillan Company, 1970.